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Effect of tetrahydrofuran on the binding of the competitive inhibitor proflavin and the storage stability of bovine pancreatic α-chymotrypsin

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Abstract

The binding of the competitive inhibitor proflavin by bovine pancreatic α-chymotrypsin in water-tetrahydrofuran mixtures was studied in the entire range of thermodynamic water activities at 25°C. The data on the binding of proflavin were compared with the results on the storage stability of α-chymotrypsin in water-organic mixtures. An analysis of the concentration dependency of these characteristics demonstrated that, at low water activity values, the interprotein contacts in the enzyme formed during its drying largely govern its functional properties, while at high water activity, they are determined by the interaction of the enzyme with the organic solvent. The interplay of these two factors is responsible for the complex shape observed for the isotherm of binding of proflavin, with a maximum degree of binding being attained at medium water activity values. © 2009 Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim.

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Keywords

Enzyme activity, Organic solvents, Proflavin, Storage stability, α-chymotrypsin